

Business Calculus
Mett

Math 121
April 23, 2003

NAME: _____

row: _____ (count from your left)

1. The marginal profit function is given by $\frac{dP}{dx} = 10 \ln(x) + 10$. Show that a possible model for profit is $P(x) = 10x \ln(x) + C$.
2. Find the total change in profit as production x goes from 6 to 10.
3. Find the average profit as x goes from 6 to 10.
4. Find the value of x that produces a max or min of the profit function. Which do you have (max or min)?

ANSWERS:

1. $(10x \ln x + C)' = 10 \ln x + 10$
2. $\int_6^{10} 10 \ln x + 10 dx = (10x \ln x)_6^{10} \approx 122.7529411$
3. $P_{avg} = \frac{1}{(10 - 6)} 122.7529411 \approx 30.68823528$
4. $x = e^{-1}$ produces a minimum since $P''(x) = \frac{10}{x} > 0$ when $x = e^{-1}$.